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ABSTRACT

This report discusses the question of the appropriateness of teacher behaviors in relation to both the counting of frequencies of teacher behaviors and the interpretation of the impact of teacher behaviors on student learning. The recent focus, in research on teaching, on the counting of teacher behaviors gives rise to a concern for the meaning as well as the frequency, of teacher behaviors. The report describes three different definitions of appropriateness and the related systems for measuring teacher behaviors. The first definition considers appropriateness in terms of teacher decision making; the second in terms of teacher behavior in classroom settings; the third in relation to academic learning time. (Authors)

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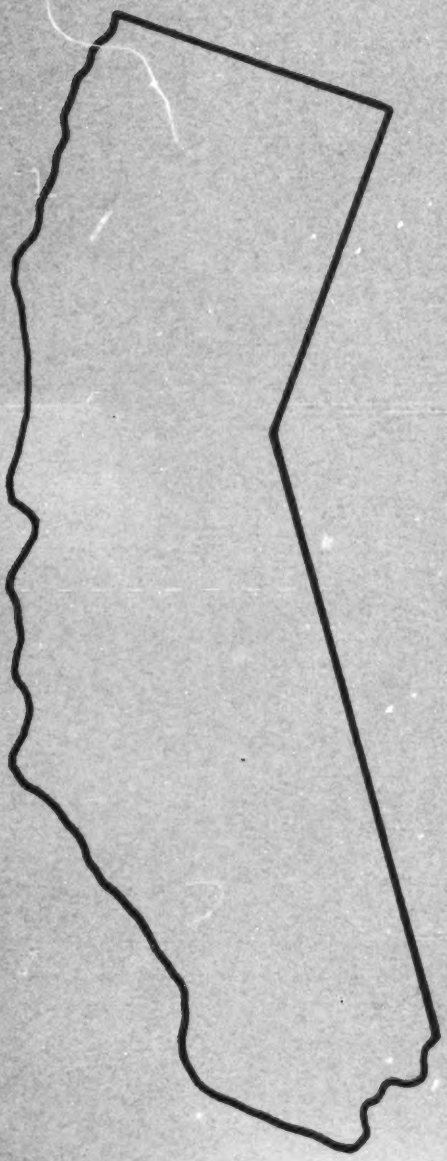

BTES

BEGINNING TEACHER EVALUATION STUDY

Technical Report Series

Technical Report IV-1
Phase III-A Continuation

PROLEGOMENON ON THE CONCEPT OF APPROPRIATENESS OF INSTRUCTION

Leonard S. Marliave
David C. Berliner

July, 1977

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Technical Report IV-1

Phase III-A Continuation

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INTRODUCTION

In May of 1975 we proposed a study of "the appropriateness of instruction." At that time we believed that educational researchers had expended considerable resources to "count" teacher behavior. A considerable amount was already known about the frequency of higher and lower cognitive questions asked per unit of time, the rate of positive verbal praise, the number of criticisms made, the number of probes, the frequency of explaining links, etc. But only relatively low correlations had been found between many of these variables and measures of student outcomes. Our work led us away from concern with just counting. We became aware of another dimension of interactive teaching that also needed some attention, and was, perhaps, one of the characteristics that kept correlational analyses from revealing very much. This was the concept of "appropriateness." In our classroom observations we had become acutely aware of the difference between a higher cognitive question asked after a train of thought was running out, and the same type of question asked after a series of lower cognitive questions had been used to establish a foundation from which to explore higher-order ideas. Teachers, we found, sometimes asked inane questions. Sometimes teachers directed questions to the wrong child. On one occasion we noticed that positive verbal reinforcement was used with a new child in the class, one who was trying to win peer group acceptance, and whose behavior the teacher chose to use as a standard of excellence. The teacher's singling-out of the student seemed to impede his efforts to win acceptance, while the teacher's count in the verbal praise category went up and up and up. This accrual of behaviors through counting often occurred when we knew, through our intuition, values and experience, that the behavior was somehow inappropriate. Our uncomfortableness was noted as we recorded many different

aspects of teacher behavior. Sometimes teachers achieved a high rate of probing student responses to questions, seemingly without regard for the student or the kind of initial response given to the question. Some students were embarassed by the probing, other student probes often occurred at inappropriate times, and sometimes probes were not forthcoming when the situation seemed to cry out for them. On the other hand, skillful probing appeared to bring out a student's knowledge about an issue and allow it to be shared with the class, after a weak first response was given by that student. In a particular interaction a teacher's questioning could have been very skillful, but much information could be lost if only frequency was recorded. Analogous difficulties in interpretation of frequency counts arose for many of the teacher behaviors which had begun to interest us. These difficulties forced a reassessment of our own strong behavioristic position for the study of teaching. We felt that frequency counts still provide very useful information, but, in our opinion, the qualitative dimension, dealing with value judgments about appropriate use of skills, must more strongly enter into observations of teaching. The "appropriateness" of teachers' behavior had to be addressed in order to study the information processing and decision making skills of human teachers in classroom settings.

We proposed the allocation of modest resources to develop the concept of appropriateness of instruction. The Far West Laboratory's research team intended to spend substantial amounts of time in grade 2 and grade 5 classrooms during the course of data collection for the work to be performed as part of Phase III-A Continuation activities. The clinical experience was intended to provide a basis for further conceptualization of the appropriateness of instruction. The findings related to conceptions of appropriateness of teaching were to be used, whenever possible, to help create the instrumentation that

was to come out of that year's effort (1975-1976). A report on appropriateness of instruction, outlining alternative conceptualizations of the concept and reporting on clinical experiences in classrooms, was to be completed and submitted to the California Commission for Teacher Preparation and Licensing by March 31, 1976.

This report, over a year late, is intended to briefly document our efforts in this area. One major reason for the delay in presenting this report is the fact that we are not very much closer to understanding this phenomenon of appropriateness than we were when we started. We continue to recognize the importance of the concept, and we continue to be confused about how best to incorporate concerns about appropriateness into research designs for studying teaching and learning in classroom settings. Nevertheless, we have some insights worth sharing.

VIEWS OF APPROPRIATENESS

Many hours were spent in the observation of classrooms by Far West Laboratory staff. All of this observation confirmed our belief that appropriateness was a variable of considerable importance. As we continued to discuss the qualitative dimensions of this phenomenon we realized we had developed at least three distinct notions about what we wanted to study. Different measurement systems, and different definitions of appropriateness are inherent in each view.

View 1: Appropriateness as Decision Making

One method of study is to regard the decision making process of teachers as the phenomenon to be judged for appropriateness. For example, much of what we think of as teaching may be characterized, in metaphoric terms, by thinking of the teacher as a Bayesian sheepdog (Snow, 1973). As the flock, or an individual animal strays from the group or the direction intended, the sheepdog goes into action in order to keep things on course. The decisions made differ from one moment to the next depending on whether it is the group or the individual that is straying, and on how close to home or pasture the group is. The teacher who has proximal and distal goals in mind constantly acts as a Bayesian sheepdog to facilitate the movement of the group and the individuals within the group to obtain a particular standard of performance in relation to those goals. The teacher who can articulate the nature of the present situation (i.e., a diagnosis) and then propose activities with a chance of remediating the situation or facilitating change toward desirable goals (i.e., prescription) can be said to be analyzing "appropriately." In this view of appropriateness the concern is with the "reasonableness" of the teacher's behavior as articulated through verbal reports, test items, questionnaires, or simulations. The report of the teacher's diagnostic and prescriptive

activity, however obtained and in whatever form, is subject to evaluation. If the report is judged "reasonable" this would indicate that the decision making skills of the teacher are of the appropriate quality expected of a professional in this field. The judgment of reasonableness must, necessarily, be made by "experts" or "professionals" who can attest that a particular set of conditions are appropriately labeled or interpreted (a diagnosis) and that the activities proposed are reasonable responses to that condition (a prescription).

Example: "The failure of anyone in my class to catch the error I made means that they can't do two column addition very well, so I'd better spend another few days on this content area before moving on."

Example: "Billy loves math but I think he may be spending too much time on it. I don't see that his reading is improving so I'd better monitor how he spends his time this week and see if the cause is really in his choice of activity."

If some panel of experts or peers judge these diagnoses and prescriptions of the teacher to be reasonable, then this teacher will be judged to be making decisions of the quality desired by those who are doing the evaluation. The teacher may be said to know what is appropriate behavior or to know how to make reasonable judgments about teaching situations. This approach to the study of teacher decision making is not very different from that of the National Teacher Examinations, a multiple-choice test in wide usage, designed to tap the teacher's knowledge of "appropriate teaching." Items on that test are scored correct if the respondent chooses the correct response to an item. Correct, for many items, means that a panel of experts has judged this response to be more "appropriate" than others.

Note that in this view of appropriateness-as-decision-making, the teacher need not carry out actions in accordance with the prescriptions articulated.

In this view appropriateness is viewed as analysis and decision making, and is not defined to be action or behavior taken as a result of the diagnostic and prescriptive activities in which the teacher engaged. Some of these concerns with the issue of appropriateness will be addressed by the Institute for Research on Teaching at Michigan State University, East Lansing, Michigan. The National Institute of Education (NIE) has established the Institute for Research on Teaching to study the decision making of teachers. Under the direction of Lee Shulman, with advice from Arthur Elstein and Richard Shavelson, all of whom have worked in the decision making area, studies are being planned and carried out to explore the teachers cognitive decision making. It is a firm belief of the Institute for Research on Teaching that a teacher's decision making is intimately linked to a teacher's behavior, and that through study of the decision making processes of teachers one can influence the interactive aspects of teaching.

We on the BTES recognize the importance of this strand of research, but we remain committed to the study of observable teaching behavior. Thus, our interest in pursuing aspects connected with this view of appropriateness has been limited.

View 2: Appropriateness as Teacher Behavior in Classroom Settings

In the first view of appropriateness the teacher's diagnostic and prescriptive activities were viewed as cognitive processes, independent of certain levels of interactive teaching behavior. Now, in this view of appropriateness, we add the component of classroom behavior by teachers to our concerns. By examining the behavior of teachers, we may find that many of the activities which take place in classes are done so quickly, and with such a lack of critical analyses, that the rules for studying the diagnostic and prescriptive behavior of teachers no longer apply. For example, the teacher who walks by a particular child and reaches out her hand to stroke his head

rarely can articulate the particular qualities of the situation which helped initiate that activity. Perhaps the teacher might be able to say, "Well, I know Johnnie always needs a little extra attention, so when I pass him by I try to show him a little love." In a sense, the activity is the starting point for an examination of whether behavior is appropriate or not, and the teacher's articulation of diagnostic and prescriptive activity in relation to his or her teaching behavior is unnecessary. In this view the activity itself can be judged independently of the teacher's ability to articulate the diagnostic and prescriptive processes related to the activity. What is required for a judgment of appropriateness, in this case, is the same sort of panel of "experts" or "professionals" as was noted in the view of appropriateness presented above. Actions still need to be judged by some competent review board that can decide whether, given a certain set of conditions, the teacher's activities appear to be appropriate or reasonable. Perhaps all that needs to be known to make these judgments are the teacher's goals. If the goals are known, people may be able to judge whether the Bayesian sheepdog metaphor is holding in a particular situation. The advantage of this approach to the study of appropriateness is that the teachers' actions probably speak louder than their words. Thus, in view two one avoids certain pitfalls inherent in view one. This behavioral view was preferred by our staff for some time, but as we continued designing the BTES study we ended up taking an even stronger behavioristic stand, described in view three.

View 3: Academic Learning Time and Appropriateness

The appropriateness of instruction is generally conceptualized in terms of activities and functions performed by the teacher, or other instructional personnel. A teacher's planning behavior, grouping practices, questioning techniques, or personal warmth may all be judged at one time or another, to be more or less "appropriate" instruction. However, in our opinion, the

underlying basis for evaluating the appropriateness of instruction must involve criteria consisting of various effects that the instruction does or does not have on students. That is, if one believes that certain instruction is appropriate in terms of the learning needs of a given student, then one must have some notion of the learning outcomes or learning behaviors that indicate the fulfillment of those learning needs.

The value of criteria. The analysis of criteria for determining the appropriateness of instruction is valuable for two purposes. First, a criteria for appropriateness provides the conceptual underpinnings for the development of a theory of appropriateness. Appropriate instruction can not be fully understood without an explication of what makes the instruction appropriate. This must include reference to the desired effects of that instruction on the students.

Second, specification of criteria for appropriateness is essential to the systematic study of appropriate instruction. Such criteria would not only provide for the identification of appropriate instruction, but they would allow for the analysis of the particular deficiencies that account for inappropriate instruction. Presumably, there will be multiple criteria in effect during any appropriate instructional activity. These different criteria would probably be invoked due to the complex interactions occurring between teaching behavior, student characteristics and situational variables. Therefore, the identification of such criteria is necessary for the study of the particular causes of different cases of inappropriate instruction.

Inadequacy of achievement gain criterion. Perhaps the most common criterion for appropriateness of instruction is learning as measured by gain in achievement. Generally, a test is administered at two points in time. The difference between the two test scores (or some variation such as a residualized post-test score) is assumed to represent the learning that occurred during

the interim period. There are several problems with this approach to the study of appropriateness. First, no account is taken of fluctuations in the student's level of knowledge. It is normal for people to forget some of what they learn with the passage of time. Therefore, the test-retest approach will tend to be less sensitive to learning that occurs earlier in the interim period than it will to learning that occurs later in the period. That is, "early learning" will be measured as less learning than "late learning."

A second problem with the test-retest approach is that it can only measure learning in the areas tested. Really appropriate instruction probably involves learning in a wide range of areas, perhaps including many academic content areas as well as various aspects of social development. It would be unrealistic to attempt to test for the entire range of possible outcomes given limitations of student time and endurance. Therefore, instruction might look good in terms of the test-retest evaluation simply because it focused on those outcomes that happened to be measured in the test. This kind of chance match with test items would seem to be an extremely limited criterion for appropriateness.

A third, and more fundamental problem with the test-retest approach lies in the fact that it does not measure the ongoing learning itself. Rather, it measures the effects of learning in terms of change in student performance. Therefore, no account is obtained of the actual events that comprise student learning. The cause of success or failure is left unknown. Furthermore, in this approach no direct tie can be made between student learning events and instructional events. Many things happen between the two tests, and it is impossible to determine with any confidence which of the myriad occurrences accounts for the change in student achievement. The student learning may even have occurred at the student's home, rather than at school. Alternatively, achievement gains on a reading test might be the result of instruction

received in a language laboratory rather than the regular reading class. Therefore, the test-retest approach is of limited use in the study of appropriate instruction.

A fourth problem with the test-retest approach is its complete lack of heuristic value. No specification is made of the events or behaviors that comprise student learning. Therefore, no theoretical implications are made for the kinds of instruction that would be appropriate antecedents to student learning. Hence, no useful model of learning and instruction is suggested by the notion that learning involves a change in student achievement.

The ALT alternative. As an alternative to using achievement gain as a (or the) criterion for defining appropriate instruction, it is possible to conceptualize, and even to measure, student learning as an ongoing behavioral phenomenon. One example of such an alternative, currently being developed at Far West Laboratory (see Proposal for Phase III-B, 1976), is Academic Learning Time (ALT). The ALT construct is in an early and relatively crude stage of development. Nevertheless, it is possible to elaborate this construct to explore its potential as a set of criteria for dealing with the issue of appropriateness of instruction. The ALT model consists of three components: 1) the instructional activity in which the student is involved; 2) the cognitive behavior of the student; and, 3) the affective behavior of the student.

The instructional activity. The appropriateness of the student's instructional activity for a given outcome can be analyzed in terms of curriculum theory. The major concern here is to identify those activities that should optimize a student's learning in a given content area. Activities may vary in terms of the lower-order objectives that are presented as building-blocks to a higher-order objective. For example, the higher-order objective, reading skills, might be attained through activities involving lower-order phonic skills, simple word recognition ("look-say" activities), or some combination

of the two. Activities may also vary in terms of the sequence in which they are undertaken by students. Taxonomical models of content goals or educational objectives might suggest that certain sequences are more appropriate than others (e.g., Bloom et al., 1956; Gagne, 1970). In addition, curriculum activities might vary in terms of underlying models of learning. For example, the student could receive a direct presentation of the concepts to be learned, as with an expository approach, or the student could be involved in activities indirectly related to the concepts, as in a discovery approach. Many other issues might be raised regarding the appropriateness of a student learning activity for a given outcome. However, it is sufficient for this discussion to conclude that one component of appropriate instruction is the instructional activity used. The criteria by which one evaluates the appropriateness of instructional activities for particular learning objectives comprise one cluster of criteria for appropriate instruction.

Cognitive behavior. The appropriateness of student cognitive behavior comprises a second cluster of criteria for appropriate instruction. Student cognitive behavior refers, here, to the particular cognitive responses of a given student when involved in a given substantive activity. This cluster of criteria consists of aptitude treatment interactions, where an individual student's aptitude interacts with the "treatment" manifested by the instructional activity. That is, the student's cognitive behavior can be appropriate only when the student is responding within an activity that is matched to his or her individual characteristics.

The appropriateness of a student's cognitive behavior can be analyzed in terms of learning theory. Mastery theory (Bloom, 1976) would suggest that a student will learn at an optimal rate only when working on a task for which he or she has acquired prerequisite skills. In addition, this theory would suggest that students learning optimally will display correct response rates

within a limited range, generally at the higher levels of accuracy. Other bodies of learning theory suggest that students will acquire information more readily or retain it over longer periods of time when they receive that information in preferred mediums, such as tactile, pictorial, or verbal sources. (Cronbach and Snow, 1977). The preferred learning medium is found to vary across different individuals. Developmental theory is also pertinent here. Certain developmental theorists, such as Piaget or Bruner, contend that individuals mature in a stage-like process, where new knowledge and skills can be acquired primarily in terms of the cognitive modes of one's current stage (c.f., Gage and Berliner, 1975). For example, an infant might learn most readily through motoric interaction with the environment, a young child might learn more effectively through visual and imaginal modes, and an older child or an adult might learn most efficiently with symbolic information and responses.

It is clear that an awesome body of complex theory is available for the evaluation of the appropriateness of student cognitive behavior. A second cluster of criteria for appropriate instruction, then, is comprised of the various approaches to the evaluation of student cognitive behavior.

Affective behavior. The third cluster consists of criteria by which one can judge the appropriateness of student affective behavior. These criteria involve the interaction of student affective characteristics with the instructional activity, as manifested by the affective responses of an individual student for a given activity.

The appropriateness of a student's affective behavior can be analyzed in terms of various bodies of theory, such as motivation and self-concept constructs. One theory of achievement motivation, (McClelland, 1965, c.f. Atkinson and Feather, 1966), contends that individual characteristics interact with task (or activity) characteristics to produce the motivational response probabilities for that person in that situation. For example, if the

individual has a high desire to succeed (rather than a higher fear of failure) and is involved in a challenging activity (with an intermediate probability of success), then that person will tend to work diligently and will be more likely to complete the task successfully (i.e., will be more likely to learn something).

Many other theories are available for the explanation of student affective behavior in a learning activity, where student personality characteristics are seen as interacting with features of the instructional activity (e.g. see Coopersmith, 1959). They provide a wealth of possible criteria for the appropriateness of student affective behavior in a learning situation.

Procedures for measuring ALT. The discussion, to this point, has been confined to rather general, even vague considerations of the theoretical possibilities for a model of ongoing learning behaviors comprised of the three clusters of criteria described above. It is hoped that the somewhat crude procedures currently used at the Far West Laboratory for measuring Academic Learning Time (ALT) can now be briefly presented without prejudicing the reader to believe that this ALT model is restricted by the unsophistication that accompanies its early stage of development.

The existing ALT model consists of one variable used to assess each of the three clusters of criteria for appropriate ongoing student learning behavior. The appropriateness of the instructional activity for a given content outcome is measured by simply coding the content category of that activity. The more closely related the content of the activity is to the specified outcome, the more appropriate the activity is considered to be for that outcome. Hence, an instructional activity involving sight words with long vowels would be considered more appropriate for the learning of long vowel decoding than would a lesson on penmanship.

The appropriateness of a student's cognitive behavior is assessed in

terms of the student's ability to carry out the instructional activity. Another way of describing this variable is that it reflects the level of difficulty of the instructional activity for the individual student. Some mixture of intermediate and low levels of task difficulty are considered to indicate more appropriate student cognitive behavior. Therefore, if the task is so difficult for a student that he or she is unable to respond correctly at all, then the student's cognitive behavior is considered inappropriate. The mixture of intermediate and low levels of difficulty is seen as reflecting appropriate cognitive behavior because this would tend to indicate that the student is alternately challenged by new material and reinforced by practice or review material.

The appropriateness of a student's affective behavior is measured in terms of the student's engagement or active involvement in the instructional activity. In other words, if the student is attentively involved in the task at hand, then it is assumed that appropriate motivational and attitudinal conditions would account for this involvement. If the student ignores or actively avoids the task, then the affective response of the student is considered to be inappropriate. The relevance of engagement to the appropriateness of ongoing learning is self-evident.

Three simple variables have been presented. Relatively straightforward techniques for measuring ongoing student behavior in terms of these variables are currently in use at Far West Laboratory. It should be clear that these variables are only rudimentary precursors to a potentially highly elaborate instrumentation to assess ALT. Likewise, the current model of ALT offers only a glimpse of the highly sophisticated conceptualization of ongoing learning that could be developed. However, the existing theory and instrumentation represent a reasonable beginning in the development of conceptual and empirical criteria for the appropriateness of instruction. The idea of

using ongoing student behavior as the phenomenological focal point for the study of learning and instruction portends considerable explanatory power. Appropriate instruction must result in some kind of learning by the student. Perhaps, then, we should start with the student when studying the appropriateness of instruction.

CONCEPTIONS OF APPROPRIATENESS AND THE DEVELOPMENT OF INSTRUMENTATION

The three views of appropriateness presented above influenced and were influenced by our observations of classrooms. As we approached the field study we had contracted to do, as part of Phase III-B, the view of appropriateness presented in View Three took precedence. We chose, for example, to measure the content areas of the materials the student was working with, their difficulty level for the student, and the student's engagement rate as indications of appropriateness. Thus, our instrumentation reflects a view of appropriateness, as given in View Three. We hope that the Phase III-B data will illuminate this area of our concern. By using ALT as a criterion for appropriate teaching, this seemingly qualitative area of concern becomes more tangible, and, simultaneously, more likely to be studied with an empirical methodology. We consider this a decidedly positive step since we continue to believe in the importance of this kind of variable in studies of classroom teaching and learning.

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